Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the Application:

Listing of Claims:

1. (Currently amended) A system for optical detection of a blowout ~~precursors~~ precursor comprising:

a combustor;

an optical measuring device in communication with the combustor, wherein the optical measuring device generates an output indicative of the intensity of the light emissions in the combustor; and

a blowout precursor detection unit that receives the optical signals and performs at least one of a raw data analysis, ~~spectral analysis,~~ statistical analysis, ~~and~~ or wavelet analysis to identify ~~a~~ the blowout precursor.

2. (Original) The system as in claim 1, further comprising a combustion controller that controls operation of the combustor based at least in part on detection of a blowout precursor by the blowout precursor detection unit.

3. (Original) A method for detecting blowout precursors in combustors comprising:

receiving optical data measured by an optical measuring device associated with the combustor;

performing raw data analysis on the optical data normalized by the mean of the optical data;

performing spectral analysis on the optical data using Fourier transform analysis;

performing statistical analysis on the optical data using statistical moments;

performing wavelet analysis on the optical data using wavelet transform analysis; and

determining the existence of a blowout precursor based at least in part on one or more of the raw data analysis, spectral analysis, statistical analysis, and wavelet analysis.

4-32. (Cancelled).

33. (Previously presented) A method for detecting a blowout precursor in a combustor comprising:

receiving optical data measured by an optical measuring device associated with the combustor;

performing raw data analysis on the optical data normalized by the mean of the optical data;

performing spectral analysis on the optical data using Fourier transform analysis;

performing statistical analysis on the optical data using statistical moments;

performing wavelet analysis on the optical data using wavelet transform analysis;

receiving pressure data measured by an acoustic pressure device associated with the combustor;

performing spectral analysis on the pressure data using Fourier transform analysis;

performing statistical analysis on the pressure data using statistical moments;

performing wavelet analysis on the pressure data using wavelet transform analysis; and

determining the existence of a blowout precursor based at least in part on one or more of the raw data analysis of the optical data, spectral analysis of the optical data, statistical analysis of the optical data, wavelet analysis of the optical data, spectral analysis of the pressure data, statistical analysis of the pressure data, and wavelet analysis of the pressure data.

34-39. (Cancelled).

40. (Currently Amended) A method for detecting a blowout precursor in a combustor comprising:

receiving combustion data measured by a combustor measuring device associated with the combustor, wherein the combustion data is used to indicate flame blowout conditions;

performing analysis on the combustion data ~~from the group of analysis techniques consisting of~~ comprising at least one of raw data analysis on the combustion data normalized by the mean of the combustion data, ~~spectral analysis on the combustion data using Fourier transform analysis,~~ statistical analysis on the combustion data using

statistical moments, ~~and~~ or wavelet analysis on the optical data using wavelet transform analysis; and

determining the existence of a blowout precursor based at least in part on one or more of the raw data analysis, ~~the spectral analysis,~~ the statistical analysis, ~~and~~ or the wavelet analysis.

41. (Previously presented) The method of claim 3, further comprising determining the existence of a blowout precursor based on a predefined change in a magnitude of the normalized optical data.

42. (Previously presented) The method of claim 3, wherein performing raw data analysis comprises:

dividing the normalized optical data into a plurality of time segments; and

defining a normalized optical data threshold.

43. (Previously presented) The method of claim 42, further comprising determining the existence of a blowout precursor based on a number of instances in a given time segment that the normalized optical data exceeds the normalized optical data threshold.

44. (Previously presented) The method of claim 3, wherein performing spectral analysis further comprises:

determining a power ratio of power in a frequency range normalized by total spectral power.

45. (Previously presented) The method of claim 44, further comprising determining the existence of a blowout precursor based on a predefined change in the power ratio.

46. (Previously presented) The method of claim 3, further comprising determining the existence of a blowout precursor based on a predefined change in a magnitude of the statistical moment.

47. (Previously presented) The method of claim 3, further comprising determining the variance of the statistical moment.

48. (Previously presented) The method of claim 47, further comprising determining the existence of a blowout precursor based on a predefined change in the variance of the statistical moment.

49. (Previously presented) The method of claim 3, wherein performing statistical analysis further comprises:

dividing the statistical moment optical data into a plurality of time segments;

defining a statistical moment threshold; and

determining the existence of a blowout precursor based on a number of instances in a given time segment that the statistical moment exceeds the statistical moment threshold or based on a total time in a given time segment that the statistical moment exceeds the statistical moment threshold.

50. (Previously presented) The method of claim 3, wherein performing wavelet analysis comprises:

determining the wavelet transform of at least part of the optical data; and

defining a wavelet transform threshold.

51. (Previously presented) The method of claim 50, further comprising determining the existence of a blowout precursor based on a number of instances in a given time segment that the wavelet transform of the optical data exceeds the wavelet transform threshold or based on a total time in a given time segment that the wavelet transform of the optical data exceeds the wavelet transform threshold.

52. (Previously presented) The method of claim 50, further comprising determining the existence of a blowout precursor based on a predefined change in magnitude of the statistical moment data.

53. (Previously presented) The method of claim 3, wherein performing wavelet analysis comprises:

defining a time segment;

determining the variance of the statistical moment data for each time segment; and

determining the existence of a blowout precursor based on a predefined change in the variance of the statistical moment data.

54. (Previously presented) The method of claim 3 further comprising:

determining a wavelet transform of at least part of the optical data;

defining a root mean square of the wavelet transform threshold;

determining a ratio of the root mean square of the wavelet transform of the optical data to the root mean square of optical data; and

determining the existence of a blowout precursor based on a predefined change in the ratio.

55. (New) The system of claim 1, wherein the blowout precursor detection unit further performs spectral analysis to identify the blowout precursor.

56. (New) The method of claim 40, further comprising performing spectral analysis on the combustion data using Fourier transform analysis.